

REMARKS

The Office Action of April 28, 2006 was received and carefully reviewed. The Examiner is thanked for reviewing this application

Claims 2-3, 5-6, 9-10, 12-13, 16, 19-20 and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue (U.S. Patent No. 4,976,839). Claims 4, 7, 11, 14, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claims 2-3, 5-6, 10, 12-13, 16 and 20, and further in view of Nomoto et al. (U.S. Patent No. 5,225,364). Claims 8, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue as applied to claims 2-3, 5-6, 10, 12-13, 16 and 20, and further in view of Yamazaki et al. (U.S. Patent No. 6,586,346).

In the Office Action, the Examiner is contending that Inoue '839 discloses forming an insulating film 12 of silicon nitride over a semiconductor substrate 11 by sputtering in a chamber with an atmosphere comprising gases including nitrogen of 50-75% of the gases. (See col. 6, lines 15-50 and claim 4). However, Applicants traverse the Examiner's rejection because Inoue '839 does not appear to describe or suggest a method of forming the insulating film 12, as provided in the present invention. Although Inoue '839 appears to disclose forming the insulating film 12 composed of silicon dioxide, phosphosilicate glass (PSG), silicon nitride, or borophosphosilicate glass in col. 6, lines 53-60 and claim 4, Applicants contend that Inoue '839 does not describe or suggest forming an insulating film (the barrier layer) comprising silicon nitride by sputtering in an atmosphere comprising nitrogen at 75 volume % or more.

Further, despite Inoue '839 disclosing a range of the nitrogen volume (50-75%) when forming the barrier layer 15, such as a titanium nitride, by sputtering in col. 6, line 8 to col. 7, line 39, Inoue '839 does not appear to describe or suggest forming an insulating film comprising silicon nitride over a semiconductor by sputtering in an atmosphere comprising nitrogen at 75 volume % or more, as recited in all independent claims 2, 5, 9, 12, 16 and 19. Neither Inoue '839, Nomoto '364, Yamazaki '346, nor any combination of the three describes or suggests the above-mentioned feature.


Therefore, Applicants contend that all independent claims 2, 5, 9, 12, 16 and 19 are distinguishable over these references.

Regarding claims 3-4, 6-8, 10-11, 13-15, 17-18 and 20-31, each of these rejected claims is a dependent claim. Accordingly, these claims are allowable over the cited references for at least the reasons discussed above for the independent claims 2, 5, 9, 12, 16 and 19. In particular, regarding claims 26-31, the Examiner is contending that Inoue '839 discloses that the targeting layer is silicon nitride layer. However, Applicants contend that Inoue '839 does not describe or suggest a target comprising silicon nitride, although Inoue '839 discloses various targets for sputtering in col. 7, lines 23-39.

Further, regarding claims 3, 6, 10, 13, 17 and 20, the Examiner is contending that Inoue '839 discloses that the sputtering is RF sputtering, or plasma (See fig. 1 and col. 6, lines 46-50). However, Applicants contend that Inoue '839 does not describe or suggest an RF sputtering method because Inoue '839 discloses a sputtering method using DC power, which is different from an RF sputtering method.

In view of the foregoing, it is respectfully requested that claims 2-31 be passed to issue. If a conference would expedite prosecution of the instant application, the Examiner is hereby invited to telephone the undersigned to arrange such a conference.

Respectfully submitted,



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